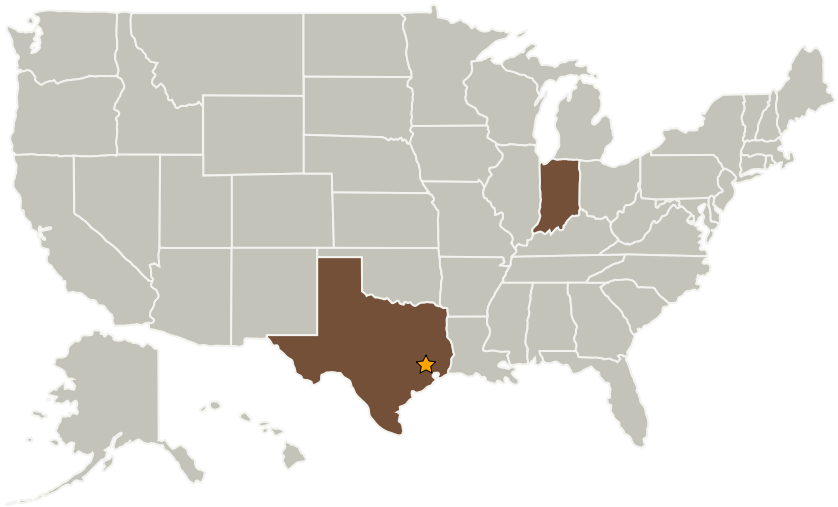
Microfluidic Multichannel Flow Cytometer, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

The proposed innovation is a "Microfluidic Multichannel Flow Cytometer." Several novel concepts are integrated to produce the final design, which is compatible with on-orbit operation from the standpoint of gravity-independence, low mass, low power requirement and automated operation. The unique design features of the Microfluidic Multichannel Flow Cytometer include compact optics based on diode technology for both illumination and measurement, tested channel branching schemes, no sheath fluid anywhere, bubble-free PDMS lithographic manufacture, and analysis based on quantum-dot technology. A design is proposed that counts RBC, WBC and three specified WBC subsets. Techshot, Inc. and scientists at Purdue University will collaborate to test the components of this innovation by pursuing the following Phase I objectives: (1) create a critical design requirements document for the Microfluidic Multichannel Flow Cytometer, (2) breadboard and test its three critical physical components (illumination, sensing optics and flow channels) and (3) critically test feasibility of each component and produce a top-level drawing suitable for initiating Phase II R/R&D to produce an integrated prototype. The final product will be robust for use in space flight and low-cost on Earth for eventual point-of-care blood analysis and global AIDS patient status monitoring.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Techshot, Inc.	Supporting Organization	Industry	Greenville, Indiana

Primary U.S. Work Locations	
Indiana	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.1 Cryogenic Systems
    - TX14.1.3 Thermal Conditioning for Sensors, Instruments, and High Efficiency Electric Motors